

# 321 CONTACT™

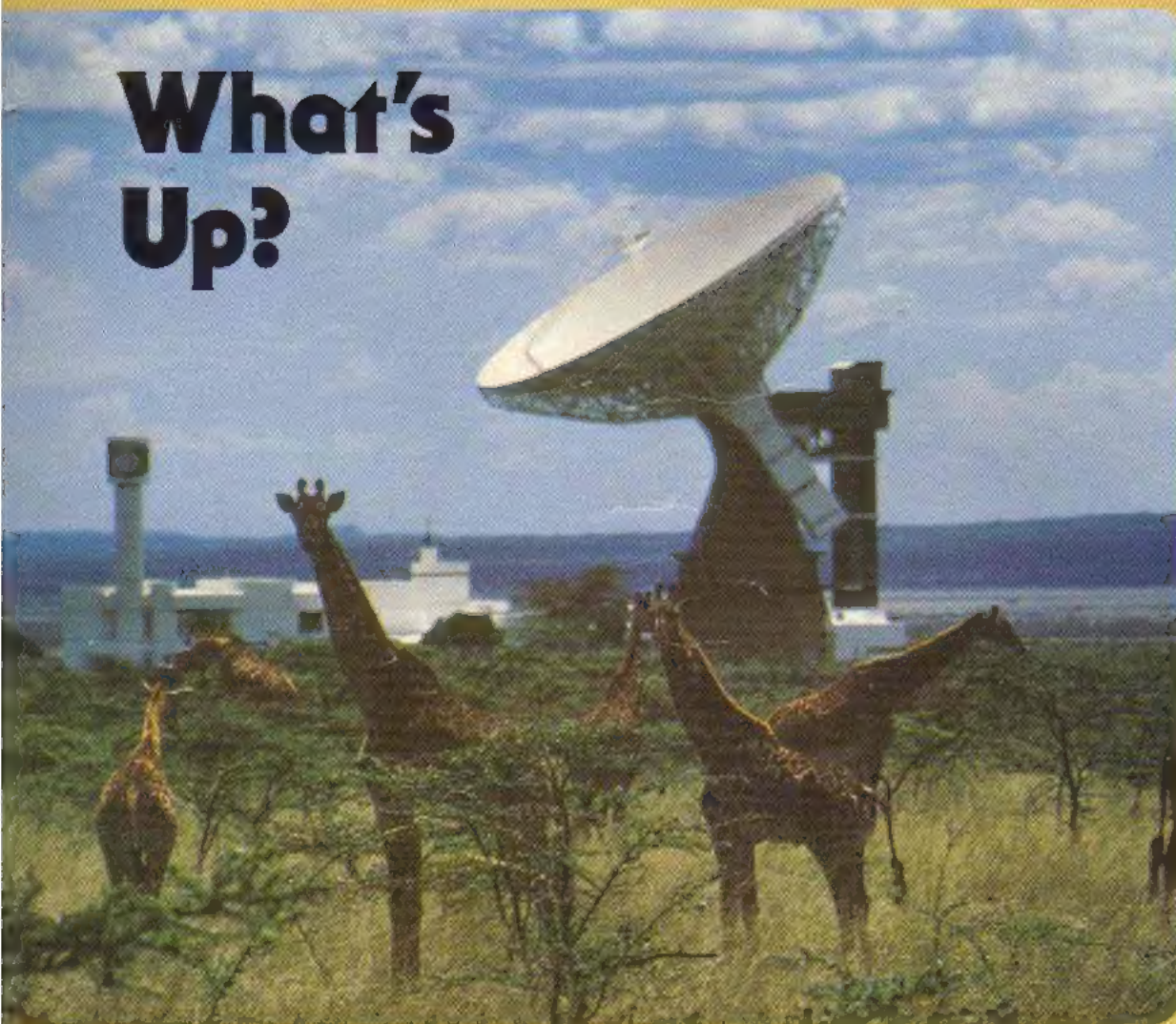
Inside: Animals on the Move!



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# What's Up?



This is a very special antenna in Kenya, Africa. And, there are hundreds more just like it all over the world. People on the ground use them to communicate with the hundreds of spacecraft that are whizzing around the earth.

These spacecraft are satellites, and they're doing all sorts of amazing things. To find out about some of them, turn to page 14.

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When the snow falls, this herd of caribou travels south to find its winter food.

# ANIMALS

Imagine you are camping in a valley in Alaska. You look through your binoculars one morning and see a few caribou coming through a mountain pass. While you're admiring them, more of these large reindeer come along. Now there are about a hundred. No, two hundred. No, five hundred. There are so many you soon lose count. As they thunder past your camp, the ground trembles from their pounding hooves. For more than an hour, the caribou parade past.

Strange as this story sounds, caribou really do travel like this. In summer, caribou live on the tundra, a large, flat plain. There they eat grass and little plants called lichens (LIKE-ens). But in winter, snow piles up on the tundra. It covers the animals' food. The caribou must travel to a forest where the snow is not so deep. They spend the winter there.

In spring, all the caribou head back to the tundra. Both trips are very difficult. Not every

caribou arrives safely. Some die of hunger along the way. A few weaker ones are killed by wolves. But none of them stays behind.

Traveling to the same place and back again, as the caribou do, is called migration. Caribou aren't the only creatures that do it. Many animals migrate, including whales, fish, birds and insects.

You won't see migrating caribou unless you're in Alaska or Canada. But soon you may be able to spot some other migrating animals. This is the beginning of the spring migration season. From now until June, great numbers of animals will be on the move.

Some of the migrating animals will be flying. Others will swim. Still others will gallop or even crawl. Migration is an adventure in which animals take part in different ways. Some go back and forth each year. Others take several years just to make one round trip.



People have learned why some animals migrate. But they still know very little about how it's done. For example, how can animals find their way to the same place year after year? How do they know when to leave? Migration is still largely a mystery.

### **The Amazing Monarch**

It takes detective work just to find out where migrating animals go. Take the case of the monarch butterfly. You've probably seen monarchs with their flashy orange and black wings. Dr. Fred Urquhart, a Canadian scientist, had seen them, too.

Monarchs living in his backyard in summer laid eggs on milkweed plants. He watched caterpillars hatch from the eggs and grow fat. He later saw them turn into butterflies. All this happened in summer. Then the monarchs disappeared. Where did they go? To find out, Dr. Urquhart marked some butterflies ➤



**Above:** Strong and healthy caribou like this one can migrate long distances safely. But the journey can be dangerous for older, weaker caribou who die along the way.

# **ON THE MOVE**

## **THE MYSTERY OF MIGRATION**

by Carolyn Jabs

Some monarch butterflies fly thousands of miles to their winter homes.







Gray whales sometimes raise their heads out of the water to look around. This habit is called "spyhopping." People are not sure just why whales do it. It may help the animals figure out where they are.

with little tags on their wings. He wanted to keep track of their travels. Each tag had a message asking the finder to send the butterfly back to him.

The scientist and his helpers tagged thousands of butterflies. Soon, people started sending them back. Many came from a certain place in Mexico. Dr. Urquhart decided to go there.

In a valley near a tall mountain, he saw what he had been looking for. Millions of monarchs were shining in the sun. "Unbelievable," said Dr. Urquhart. Even more unbelievable was finding a butterfly that had been tagged by his helpers. It had traveled over 2,000 miles to reach the valley.

Dr. Urquhart decided that the monarchs went to Mexico to find food in winter. But there still remains a bigger riddle to solve. How do they find their way to the valley when they had hatched in Canada and had never been to Mexico before?

### **The Mighty Salmon**

Salmon also travel a long way when they migrate. When these fish hatch, they live in a rocky nest at the bottom of a fresh water river. Later, baby salmon float down the river into the ocean.

There the food supply is better. The salmon lives in the ocean for one to four years. It eats smaller fish and grows fat.

But one day the salmon heads back to fresh water. This trip is much harder because it must swim against the current. Sometimes the salmon comes to a waterfall or a dam. Then it leaps out of the water to try to get to the top. If a dam is too tall to leap over, people must build fish ladders. The ladders are steps covered with water. The salmon must jump up each step to get over the dam.

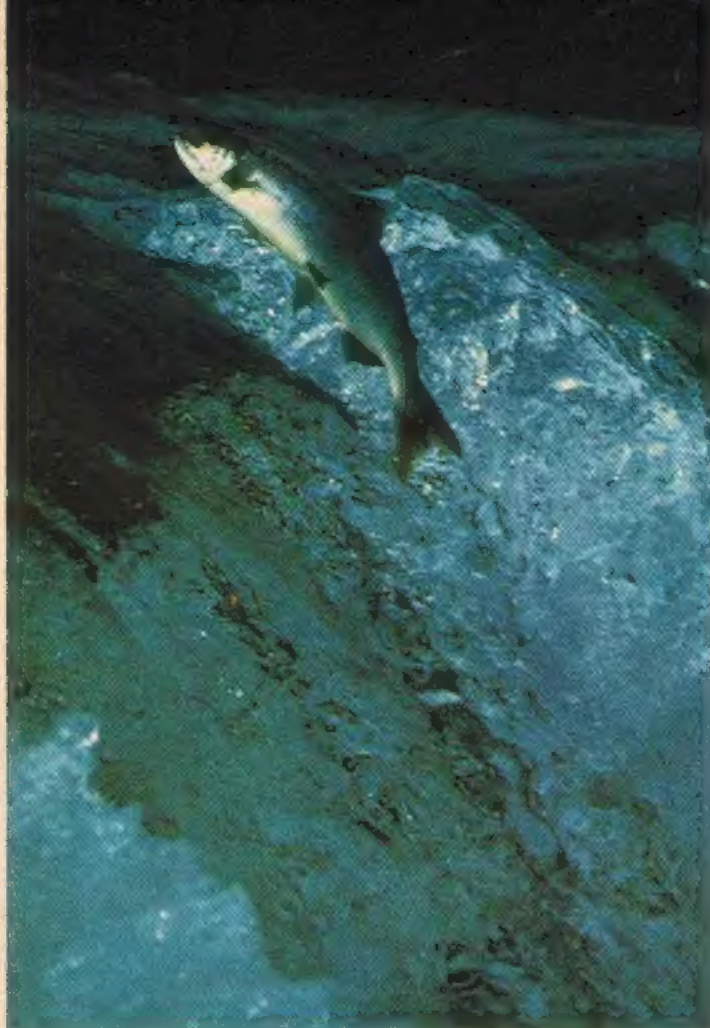
Finally, the salmon reaches the place where it was born. It mates with another salmon and lays eggs. Then the whole cycle starts over again.

### **The Gray Whale**

Whales also migrate to have their babies. The gray whale lives near the North Pole. There, whales can find plenty of krill, their favorite food. After eating tons of these shrimp-like creatures, they grow a layer of fat, or blubber. Their blubber helps keep the whales warm in cold water.

In the fall, about 11,000 whales get together to swim south. As the whales go by, people gather





along the Pacific coast to watch.

Whales keep swimming until they reach the shallow waters on the Mexican coast. The warm water there makes it a good place for mother whales to give birth. Their calves are born without any blubber. If they were born up north, the calves might get cold and die. The whales swim 6,000 miles so their calves can be born in warm water.

### **Champion Migrants**

Six thousand miles is nothing compared to the distances some birds travel. Every year, the arctic tern flies from the North Pole to the South Pole—and back. That's a round trip of 22,000 miles!

When it comes to migration, birds are the champs. More than 20 billion of them go south every fall. How do so many birds know when to go? According to researchers, birds have something like a clock inside them. It warns them to get ready in the fall. As the days get shorter, the birds begin to get restless. First, they gather in little groups. Then the birds form flocks. Finally, all the birds set out together.

But the question of how they know where to go has scientists puzzled. They think some birds

**Left:** It isn't easy for this salmon to travel from the ocean back to the river where it was born. It must swim upstream and leap over tall waterfalls.



The arctic tern spends a lot of its time in the air. This champion migrant flies about 22,000 miles a year. It goes from the North Pole to the South Pole and back again.

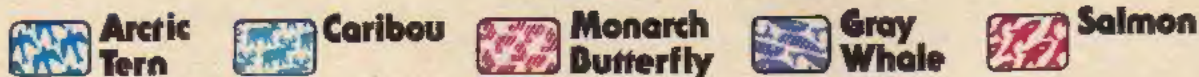
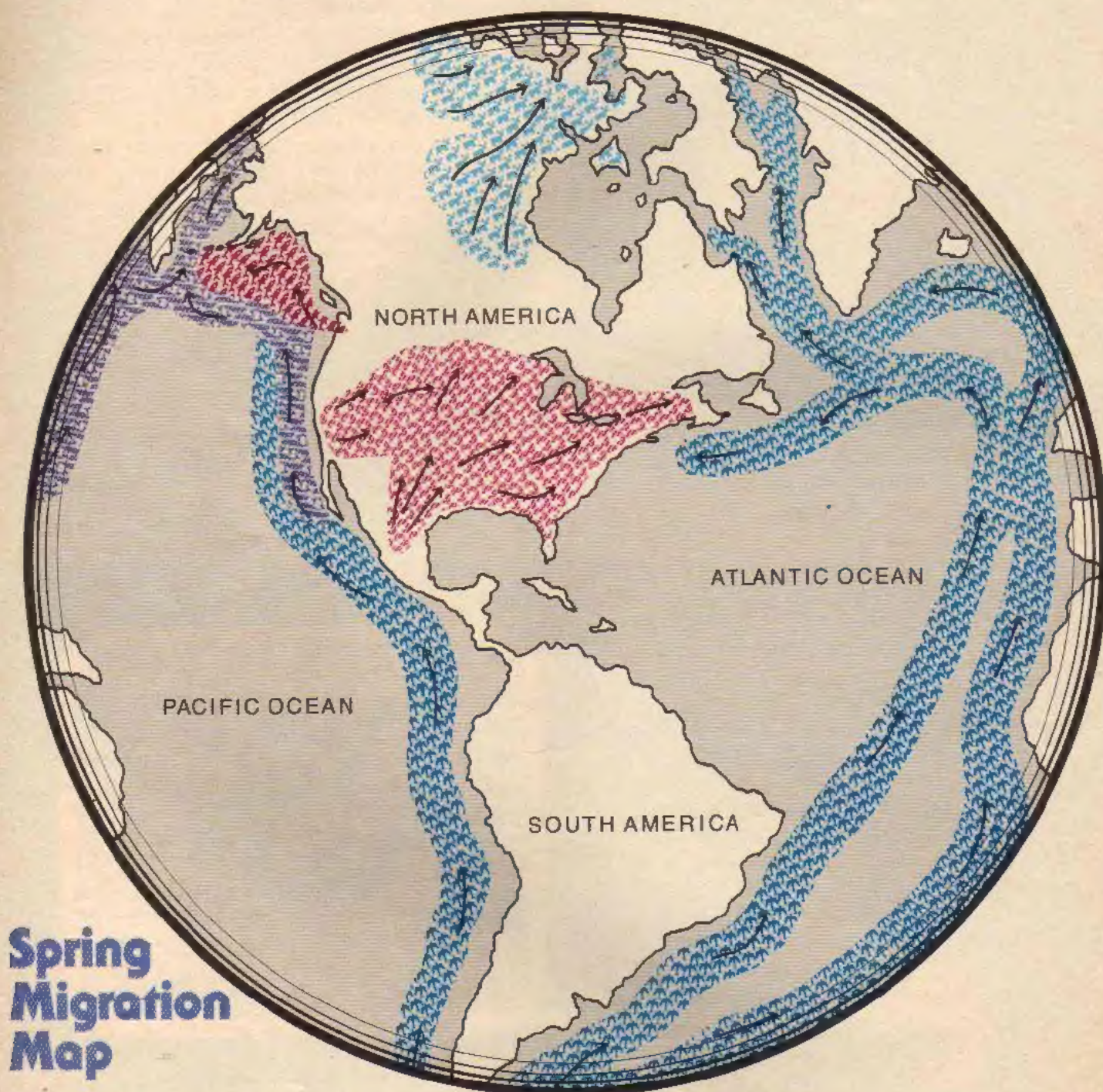


follow landmarks, such as rivers and mountain ranges. From up in the air, a river can look just like a line on a map. Other birds travel over the ocean or at night. They may use the sun or stars as guides. A few birds, such as homing pigeons, seem to have a sort of compass inside their heads. It keeps them going in the right direction.

Birds follow the same path year after year.

These paths, called flyways, are like highways in the sky. If you live under one, you will see the same kinds of birds coming and going each year.

Even if you don't live under a flyway, it's still worth your time to look for migrating animals this spring. Migration is one of the great adventures of nature. People are learning more and more about it. But migration is still mostly a mystery.



This map shows you where the five animals in the story go when they migrate. The animals are represented by the colored symbols listed above.

Arrows indicate the directions in which these animals are traveling at this time of year.



## Body Puzzles

There are 22 parts of the body listed here. Both puzzles use the same list.

## Word List

ANKLE ✓ HEAD

ARM 2 HEART

## BONES & KNEE

CALE✓ / LIPS

CHEST / MOUTH

CHIN NOSE

EARS ✓ SCALP

EYES ✓ SHOULDERS

FIST STOMACH

FOOT      TEETH

HAIR *1 1/2* TOE

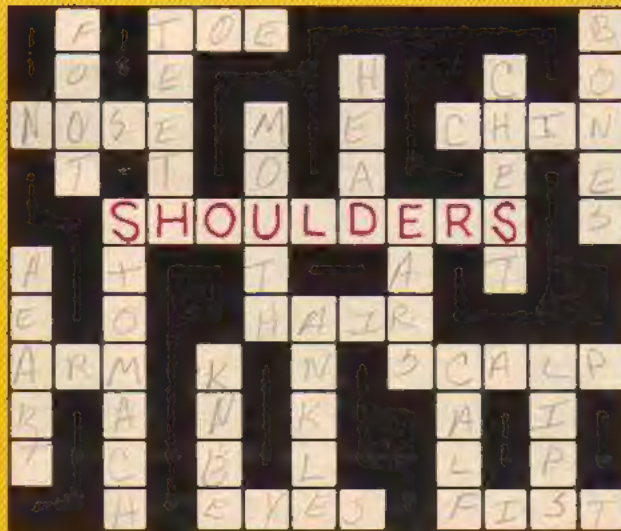
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H	H	B	E	T	O	O	F	R
S	T	O	M	A	C	H	I	N
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L	Y	E	B	L	H	S	L	H
K	T	S	I	F	D	E	T	F
N	E	O	T	R	A	E	H	N
A	D	S	E	Y	E	N	R	O
C	H	E	S	T	H	K	A	S
N	D	H	T	U	O	M	Y	E

## 1. Word Hunt

The parts of the body are hidden across, up and down and diagonally. Some of them are backward.

## 2. Crossword

Figure out how the parts of the body fit into the empty squares. We've done one for you to get you started.





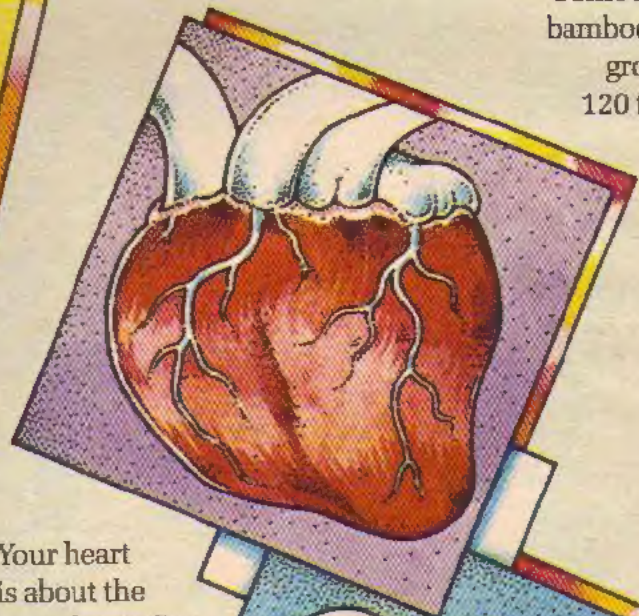
# Factoids



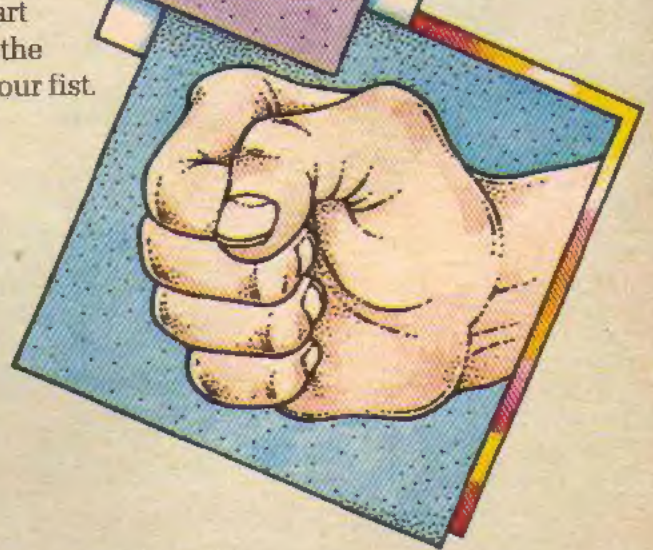
About 78% of all creatures living on earth are insects and spiders.



Some kinds of bamboo plants grow to be 120 feet tall.



Your heart is about the size of your fist.



Cinnamon comes from the bark of a tree.





In addition to fingerprints, toe, foot and palm prints can be used to reveal a person's true identity.



The average bolt of lightning has enough energy to keep an air conditioner running for almost two weeks.



At birth, a walrus is about four feet long.



# Contact Report

**Salad in Space** Space suits have been around for quite a while. For people, that is. Now two California scientists are designing space suits for plants. The "plant suits" will make it possible for astronauts to grow their own food on long space missions.

Each suit is a plastic tube with a cap on both ends. Inside the tube is a metal rod from which the plant hangs. As the plant grows, the roots spread down into the other end of the tube. Outside tanks spray the plant with food and air in mist form. There's even a computer to check if the plant is growing well or needs more food.

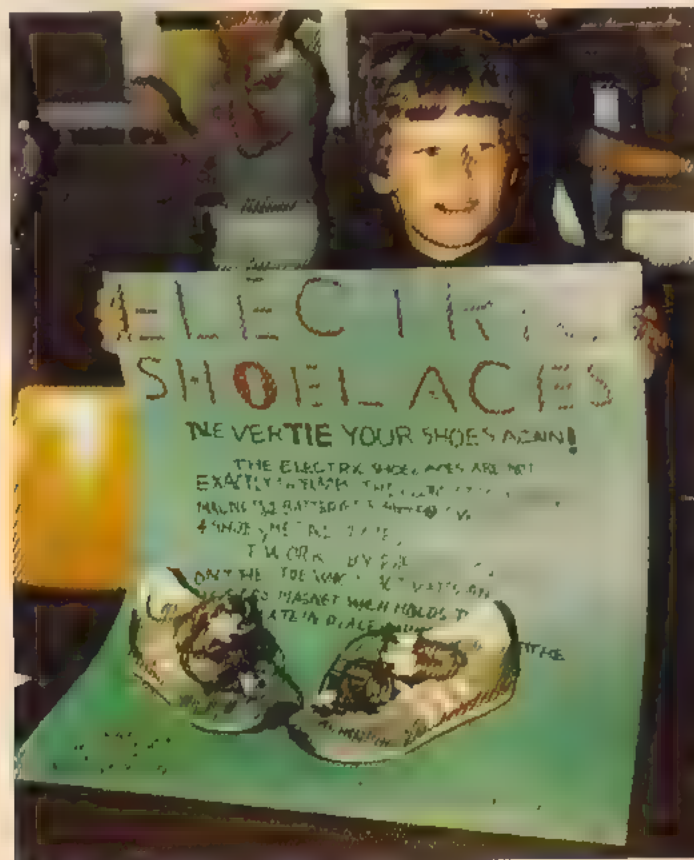
On earth, space suits have already grown lettuce, tomatoes and rice. By the mid-80s, NASA hopes to use them for gardens on the space shuttle.

Astronauts who grow their own food could live up to five years in space. And they would never have to call earth for a take-out delivery!

—Written by Michele Lyons



This is how astronauts will grow food out in space.



**Push Button Shoelaces** Want to solve a problem that bugs you? Then become an inventor like 10-year-old Arthur Meacham. Arthur was just plain mad because his shoelaces kept coming untied. Suddenly he got this crazy idea — electric shoelaces.

Arthur is one of several hundred Massachusetts kids who attended an invention convention last summer. The students studied the history of inventions. Then they came up with one of their own.

His electric shoelaces won Arthur the prize for the wackiest invention. Though they sound strange, they really work. "When you press the button on the toe," he explains, "the electromagnet is activated." That holds the metal plate in place. The plate keeps the shoe firmly on your foot—until the battery runs down, that is.

Students from 9 to 14 have attended the invention convention for the last three years. Wacky winners from the past have included a nose muffler, an electric air-conditioned hat and lighted glasses.

—Written by Anita Brennan

Arthur invented a brand new kind of shoelace.



# Contact Report

**Sideways Elevators** Today's elevators go up and down. But the elevators of tomorrow may go sideways as well. When you step inside, you may push one button to choose your floor and another to pick your direction.

The first of the new elevators is called a "people mover." Built by Otis Elevator Company, it looks like a little bus without wheels. It moves people around a hospital in North Carolina.

The elevator car rides on a cushion of air as it follows a concrete track, or "guideway." Huge fans underneath blow air downward. This pushes the elevator up about a half inch. But it settles back to the track when coming to a stop—so people can get in and out.

The new elevator holds up to 37 passengers. It moves them from one place to another in less than three minutes. And best of all, it works automatically. A computer does all the driving!

—Written by Michele Lyons



This elevator moves people sideways, not up and down.

**Move Over Squirt!** Gerbils are cute little mouse-like animals. Usually they live to be four years old, but a gerbil named Sahara is another story. Last year, she reached the grand old age of eight.

Aaron Milstone, Sahara's owner, now stands a chance of becoming famous. His pet set a new record for old age in gerbils. So Aaron—and Sahara, too—likely will be mentioned in the 1982 Guinness Book of World Records. Sahara beat the earlier record of 7 years, 9 months set by a gerbil named Squirt.

Sahara may make him famous, but she is only one of 12-year-old Aaron's pets. He also lives with one Japanese quail, a few butterflies and several giant South American cockroaches.

Information for this Contact Report was sent in by Aaron Milstone, Lathrop Village, MI.

**What's That?** Have you seen a story in a newspaper or magazine that belongs in the Contact Report? Why not cut it out and send it to us? Be sure to include your name, age, address and the place you found the story. Send it to:

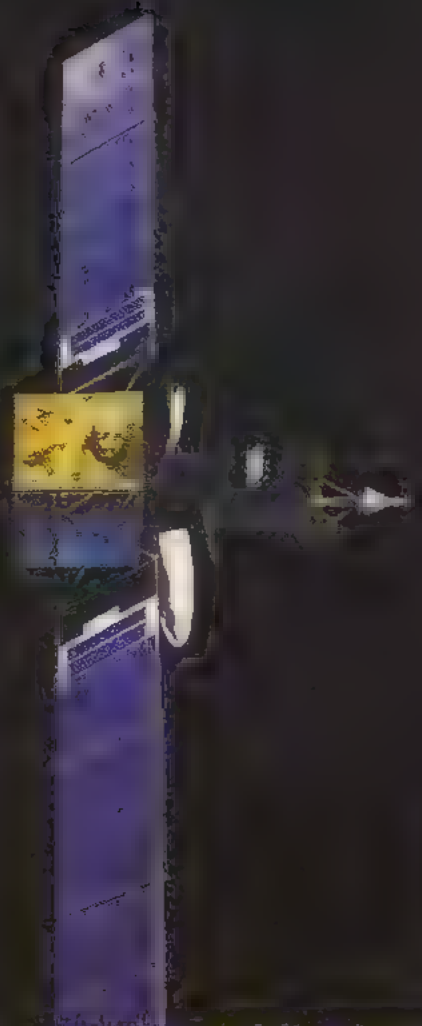
The Contact Report  
P.O. Box 599  
Ridgefield, NJ 07657



Aaron's pet is the world's oldest gerbil.



From 22,300 miles in space, communications satellites like this one beam phone calls and TV shows around the world. The solar panels provide energy for the satellite.



# WORLD WATCHERS

## SATELLITES SOAR TO NEW HEIGHTS

by Renée Skelton

Don't look now, but hundreds of robot-controlled spaceships are circling the earth. They are passing coded messages around the planet, snapping pictures and shooting beams of radiation at the earth.

Does this sound like the beginning of some strange science fiction story? It's not. The fact is that there are spacecraft up there. But don't panic! They are not part of some alien invasion force. These vehicles are satellites designed by scientists on earth.

Chances are, the only spaceships you ever hear about are the ones, like the space shuttle, that carry people. That makes sense but spacecraft carrying astronauts is still a rare event. Dozens of other rockets blast off into space every year. They carry satellites that are placed in orbit around the earth.

These satellites have no people on board. But that doesn't keep them from doing some amazing and important things. Some satellites help spot forest fires *before* they happen. Others can spot pollution changes in the middle of lakes. Still others can locate objects as small as a baseball!

These satellites aren't on their own, though. All over the world they are linked to earth stations. These stations have huge disk-shaped antennae which point to the sky. They can be used to collect information from satellites or beam up new instructions to them.

What does all this have to do with you? A lot more than you might think. What goes on high in the sky affects your life down on the ground. For more on just a few things that satellites do for you, keep reading.



## Weather Watchers

Most weather forecasters keep their feet firmly on the ground. But they have some very high flying helpers. These are the weather satellites, called GOES and NOAA.

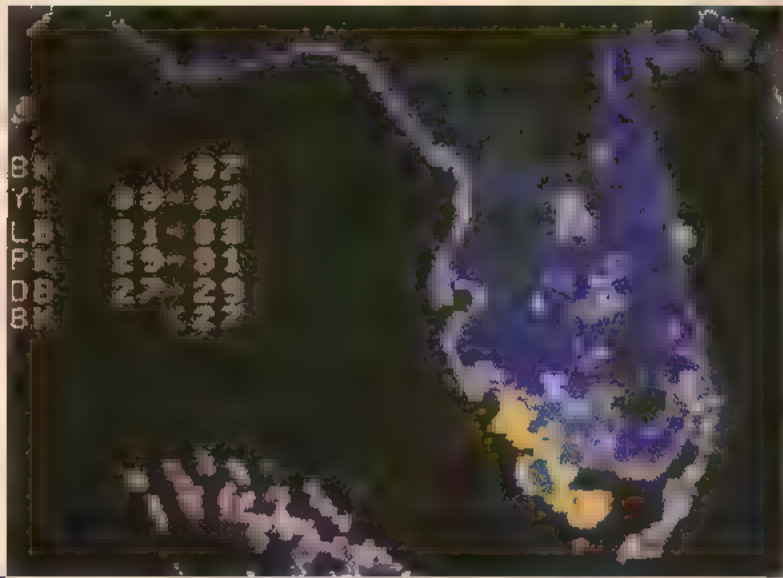
There are two GOES satellites. One watches the eastern half of the United States, while the other watches the west. Every half hour, they beam pictures of cloud formations to weather stations all over the country. These are the "satellite photos" you see on the TV weather report.

GOES does its most important work during weather emergencies, such as hurricanes. At these times, it sends pictures down every 10 minutes. Meteorologists can carefully watch the movement of a killer storm and warn people in its path.

The GOES satellites are in a very special orbit. They are always watching weather patterns over North and South America. But who is watching the rest of the world? NOAA, that's who.

The two NOAA satellites circle the world every day. They keep an eye on weather patterns that cannot be seen by GOES's cameras. Weather forecasters use NOAA's pictures to see what weather is heading toward the U.S. That way, they can predict the weather several days in advance.

**Below:** A technician adjusts a small earth station antenna in Virginia. Hundreds of ground stations all over the world keep people in touch with orbiting satellites.



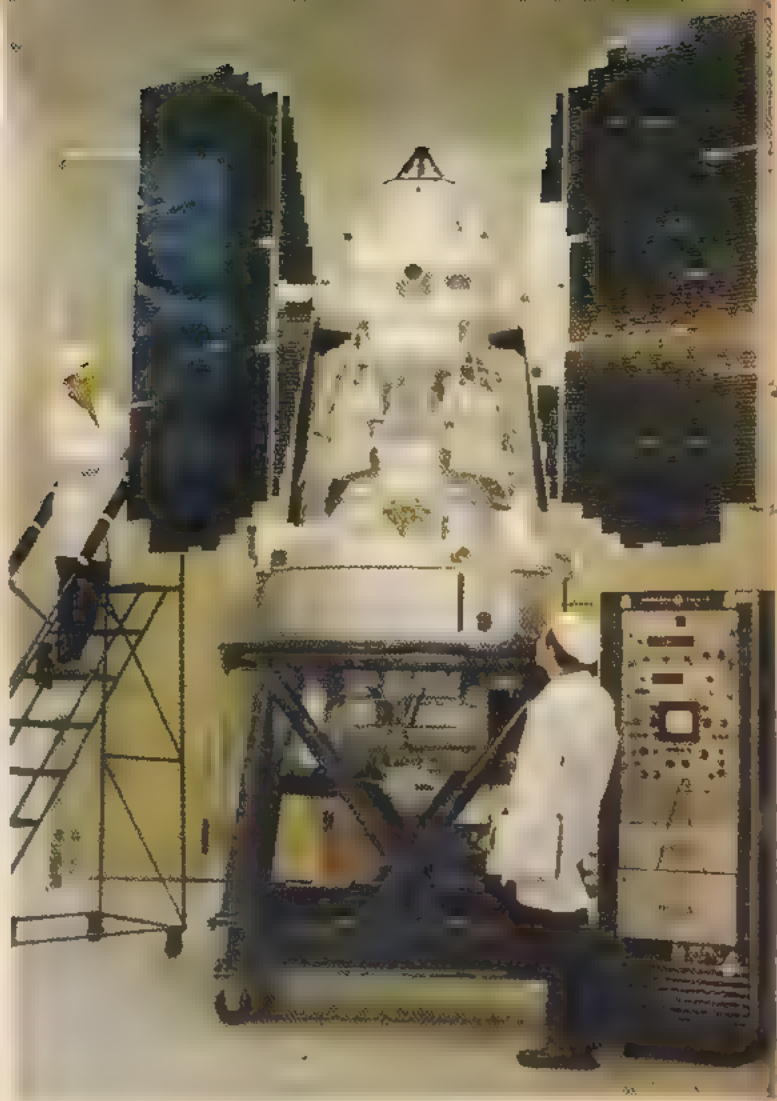




**Above:** ECHO 2, one of the United States' first communications satellites, sitting on top of the rocket that put it in orbit in 1964.

**Above Right:** Technicians check out LANDSAT's systems before it goes to the launch pad.

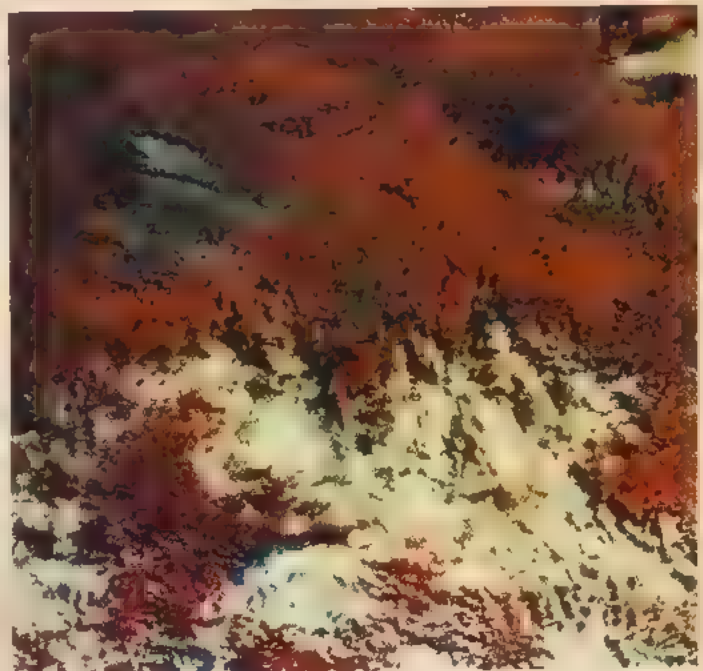
**Right:** LANDSAT produces images like this from 570 miles in space. Forested areas look deep red. You can see blue-gray streams of smoke from a forest fire in the top left corner. Pictures like this help people find and control these fires.



Japan. First you dial the number. Then a signal is sent to an earth station near your home. There an antenna beams the phone signal to a satellite flying 22,300 miles above the Pacific Ocean. The satellite receives the signal and bounces it down to an earth station in Japan. From there it would travel to the telephone in your pen pal's house. Since microwave beams travel at the speed of light, all this happens in less time than it takes to say 3-2-1 CONTACT!

### Space Pictures

Could you tell an oak tree from a maple tree from 500 miles away? Of course not! But LANDSAT





can. This satellite takes some very unusual pictures.

Every object reflects light in its own special way. Scientists call this an object's *spectral signature*. LANDSAT's cameras are designed to pick up this signature. As a result, it can identify certain objects as easily as your signature on a piece of paper identifies you.

LANDSAT can help people do all sorts of things. For example, clean and dirty water reflect light differently. LANDSAT can take pictures of this difference. Maps then can be made showing the location of pollution in lakes and streams. LANDSAT can also find certain trees in the middle of a forest. It can even show farmers where the best spots are for planting certain crops. Amazing!

### **What Goes Up . . .**

There are nearly 5,000 earth-made objects whizzing around our planet. Several hundred are working satellites. The rest is space junk, including old satellites that no longer work and parts of rockets and space capsules that were set adrift in space. Sooner or later all these things will fall back to earth. More than 8,000 objects have already come down

Probably the best-known falling satellite was Skylab. This was the largest U.S. satellite ever built. People all over the world waited for it to fall in July 1979. Though some people were scared, Skylab fell harmlessly to earth.

Satellites fall out of orbit at speeds of thousands of miles per hour. As they fall through the atmosphere, friction creates intense heat. Like shooting stars, most of them burn up before ever reaching the ground.

### **What Next?**

In the future, satellites may do even more spectacular things. In 1985, NASA hopes to use the space shuttle to launch a telescope satellite. One year later, several countries in Europe hope to send a satellite to observe the arrival of Halley's Comet—the most famous comet in our solar system. There are even hopes to someday build giant power stations in space that would beam solar energy to earth.

These are just a few of the out-of-this-world ideas people have for satellites. You will probably live to see a lot more. After all, when it comes to satellites, the sky's the limit!

In the future the space shuttle will carry satellites up into space. In 1985, NASA hopes to send up an orbiting telescope like this in the shuttle.





# Any Questions?

## Why are black widow spiders dangerous?

We know spiders aren't your favorite little critters. But there is no reason to jump up and start yelling when you see one. Unless the spider you see happens to be a black widow, that is.

The black widow is one of the few dangerous spiders found in the United States. Almost all the other spiders make venom, or poison, too. But they use it only to kill the insects they catch and eat. Most spider venom is harmless to humans. Only a few spiders, including the black widow, have venom that can hurt people.

The bite of a black widow can make people very sick. It may cause high fevers and serious stomach pains. Some people have even died after being bitten by a black widow.

The black widow only bites when she feels threatened. So next time you see a big black spider, look carefully. Does it have a design on its belly that looks like a red and yellow hourglass? If it does, quietly get up and run away!

Question sent in by Joe Zemek, Phoenix, AZ



## What caused the ice age and when will the next one be?

There have been several ice ages during the history of the earth. The most recent one began almost two million years ago. Huge masses of ice, called glaciers, moved across the northern continents. About a third of the planet's land was covered with ice.

No one is certain why ice ages occur when they do. There are many different theories. Ice ages could be caused by the earth's climate getting colder or warmer. Or they might be due to big changes in the ocean's currents. Continents that slowly shift could be the answer, too.

Most experts agree that another ice age is possible in the future. But don't put on the long underwear just yet. These kinds of changes take time. Another ice age is at least 10,000 years away.

Question sent in by Kristin Lamberth, Scottsboro, AL





Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

**Any Questions?**  
**3-2-1 CONTACT**  
P.O. Box 599  
Ridgefield, NJ 07657

**Why is it harder to breathe as you go up a mountain?** How do you think of air? As a whole lot of nothing? Air may feel like nothing. You certainly can't see it. But actually it is quite heavy.

The weight of air creates air pressure. This pressure is the result of air being weighed down by more air above it. At sea level, the air pressure is greater than it is high on a mountaintop. Sea level air is more concentrated. There's loads of oxygen in each breath you take.

As you start climbing a mountain, the air around you has less pressure. There is less air above it to weigh it down. You could think of it as if the air were getting thinner. The higher you go, the thinner it gets. Now when you breathe, there is less oxygen in each gulp of air. So you must breathe a lot more in order to take in all the oxygen that your body needs.

*Question sent in by Tina Gelinis, Manchester, NH.*



## **How do scientists know what colors dinosaurs were?**

They don't! At least not for certain. Dinosaurs roamed the earth millions of years ago. By the time the first people came on the scene, dinosaurs were long gone.

But traces of dinosaurs are still around. Their bones, teeth, eggs and even footprints are found in fossils. Scientists called paleontologists (PAY-lee-an-TAL-e-jists) study fossils to learn what dinosaurs and other ancient animals were like.

Fossils show that the dinosaurs were like reptiles. Some of their relatives are still living today. Snakes, lizards, alligators and turtles are all modern reptiles. They have scaly skin and lay eggs.

Most of today's reptiles are gray, green or brown. So most dinosaurs are pictured in the same colors. It makes sense. After all, there are no pink alligators. So chances are, there were no pink dinosaurs either.

*Question sent in by Kate Thornton, Ann Arbor, MI.*







MONARCH  
BUTTERFLY

OPOSSUM

ANHINGA

IBIS

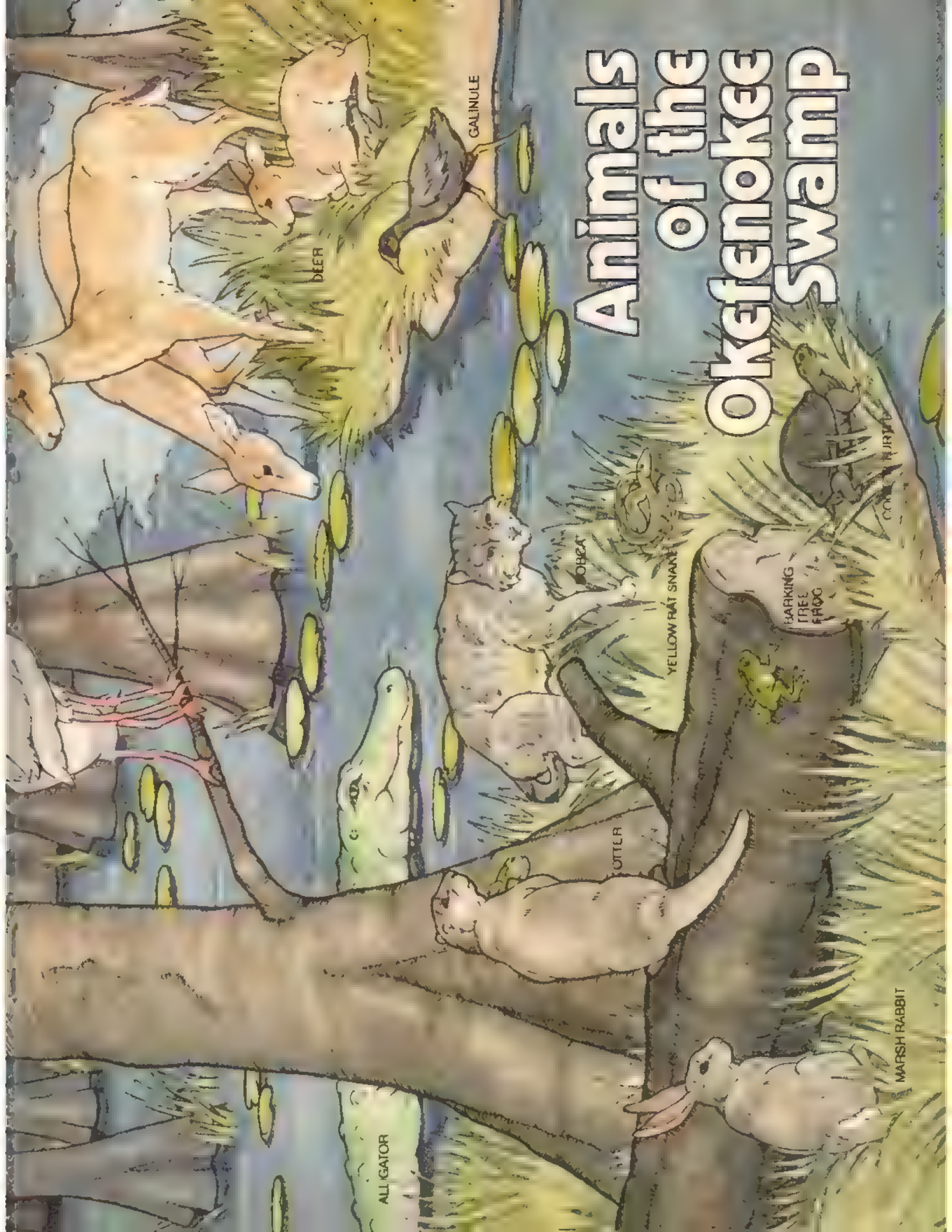
EGRET

AME RICA  
CHAMELEON

RACCOON



# Animals of the Okefenokee Swamp



DEER

GALINULE

COBICA

YELLOW RATT SNAKE

CHARKING  
TREE  
FROG

COCKAT  
BIRDS

OTTER

ALL GATOR

MARSH RABBIT



# The Bloodhound Gang



## The Case of the Invisible Knife

Part Two

by Judy Rosenbaum

In last month's episode, the Bloodhound Gang had gone to a museum to see a Sherlock Holmes exhibit. When they arrived, they discovered that a valuable stamp had been stolen. All clues pointed to Mr. Chan, the museum's guard and a friend of Vikki's. It was up to the Bloodhound Gang to prove he was innocent.

Mr. Chan sat in the exhibit room. Around him were the Bloodhound Gang, the sheriff and his deputy. On the old table near Mr. Chan was a very new glasscutter. "It's mine," admitted Mr. Chan. "But I swear I didn't use it for any crime. I used it this morning to replace a broken window-pane in the kitchen. Then I got nervous when you started questioning me about the cut glass. But go see the new pane for yourselves."

"We already checked it out," said the sheriff. "But we also learned that you've been having money troubles. I have to consider that a motive."

Mr. Chan insisted, "I'd never steal anything. Not if I were down to my last dollar."

Vikki pulled the others out into the hall. "I couldn't watch anymore. We've got to prove he's innocent."

"Maybe we can find the real thief," said Ricardo.

"Could someone else have used his glasscutter?"

"If they didn't," said Vikki, "our only choice is that someone carried an invisible knife past the metal detector. Anyone want to bet on that?"

Zack said, "Let's go check out the other suspects."

The Gang found Mrs. Mears serving tea and fruit. Mr. Leiberman drank tea while the French woman was nibbling grapes. She looked up and saw the Gang, but said nothing. The young man smiled at them. "Little young for police, aren't you?" he said.

"We're private detectives," said Zack.

"Oh," said the man. "Well, you're still young."

Sheriff Forbes came to the doorway. Vikki went to meet him, followed by the others. "Did you arrest Mr. Chan?" she said in a low voice.

"I'm going to question him a bit more," said the sheriff, taking the Gang back to the main exhibit room. "We'll have our lab check the cutter to compare it to the cut edges on the glass. As for the museum visitors, I'll have to let them go. There's not enough evidence to hold them."

"What do you have on them?" asked Ricardo.

Sheriff Forbes read from his notebook. "Mr. Leiberman, the man with the pacemaker, is a retired artist. He came to the Holmes exhibit because he collects rare mystery books."



"And maybe rare stamps as well?" said Zack. "He was the only one who set off the metal detector. He said it was his pacemaker, but maybe that was only a decoy for something else he was carrying. Like a glasscutter."

"But Mr. Chan searched him," said the sheriff. "And so did Deputy Novak. Still, perhaps he had a way of hiding tools that we haven't thought of. After all, someone has also managed to hide the stamp somewhere." He checked his notes. "Mrs. Caron is next. She's a French woman who owns an antique shop in Paris. She's vacationing here."

"And looking for antiques to steal for her shop?" said Zack in his best Sherlock Holmes voice.

"I wouldn't count on it," said the sheriff. "Anyway, stamps, even valuable old ones, aren't sold in antique shops." He turned a page in his notes.

"Next, Rod West, age 21, works part time at a jeweler's. He's a college student who came here because he's writing a class report on Conan Doyle."

"So altogether we have four suspects," said Zack. "Well, what would Sherlock Holmes do now?"

"You're the Holmes expert," said Ricardo. "You tell us."

## A Careful Search

Zack remembered Holmes stories in which the detective had found secret passages that had been used as hiding places. Could there be a concealed passage upstairs? "Maybe Holmes would have checked the scene of the crime again," he said.

"While you do that, I'll let the others go," said the sheriff. "I'll meet you downstairs, okay?"

Soon the Gang was going over every inch of the scene of the crime. Zack thumped on walls, listening hopefully for the hollow sound of secret doorways. The others poked into corners and under tables. But they found nothing.

"Zero," said Ricardo glumly. "Zip. Zilch. No weapon. No stamp. No evidence. Swell detectives we are."

"I wonder how the thief got the stamp out of here," said Zack. "All the suspects were searched."

"And that's not all," said Vikki. "Do you realize how hard it would be to sell a rare stamp like that? Lots of other stolen valuables can be changed so they can't be traced. Jewels, for example, can be reset in a different piece of jewelry. But the minute the thief tried to sell this stamp, it would be recognized."

"What are you getting at?" asked Ricardo.

"I remember reading once that some greedy rich collectors hire people to steal valuables. A collector like that would keep the stolen piece locked away. No one else can ever see the piece, but all the collector cares about is owning it."

"Robbery to order," said Ricardo. "Wow!" Then he said, "Vikki, do robbers disguise the stolen jewels by cutting them apart and resetting them?"

"That's what I read," Vikki said. Then her eyes took on a faraway look. "Jewels," she said, smiling. "It couldn't be."

"What?" demanded Zack.

"I think I know what the invisible knife looks like," she said, dashing downstairs.

Zack and Ricardo followed. When they caught up, she was already talking excitedly to Sheriff Forbes. He nodded his head in agreement. As the others ran up, Sheriff Forbes said, "How would you three like to go for a squad car ride?"

"Where to?" asked Zack.

"I'll tell you in the car." The Sheriff stayed behind to talk to Deputy Novak and Mr. Chan. From the car, Zack saw Mr. Chan smile for the first time that day. Had Vikki succeeded in clearing him?

In the car, Ricardo said, "What is this all about?"

## The Glasscutter Appears

Vikki said, "It's about the invisible knife. We've been calling it invisible because it got through the metal detector. But it didn't have to be magical or ghostly. It just had to be made of something other than metal."

Ricardo was beginning to understand. "You can't use wood or plastic to cut glass," he said. "But I remember there's a way of measuring how hard minerals are, on a scale of one to ten. Anything with a high number can scratch or cut things with a lower number. And guess what's highest of all?"

"Steel?" said Zack. It was all he could think of.

"No, steel's a metal," said Vikki. "We're looking for something else. And highest on the scale—a perfect ten, you might say—is diamond."

Ricardo continued excitedly, "Diamonds are used in industry as cutting tools. And they're even used by jewelers to cut other diamonds. In fact, nothing but a diamond can cut another diamond."

"The jewelry store," Zack almost yelled.

"That's right, Zack," said the sheriff from behind the wheel. "Rod West. It's the strongest lead we've



had so far. He works in a jewelry store and could get a diamond cutter easily. Before we left, I had Deputy Novak and Mr. Chan start looking for the cutter in the trees below the window. West probably threw it out after he finished with it."

The Gang could hardly wait until the car pulled up near Rod West's college dormitory. Once inside, the sheriff stopped at the front desk and got directions to West's room. He led the Gang up to the second floor and knocked on the first door.

West opened the door. He looked surprised when he saw who it was. Then he said smoothly, "Sheriff! Is something wrong?"

"I just wanted to ask you a few more questions," said the sheriff. "May we come in?"

West let them into a small cluttered room. The late afternoon sunlight showed piles of books and papers, a stereo, sneakers, an unmade bed and a tall potted plant. It was a tight fit for the four visitors. "What do you want?" West asked.

The sheriff explained their theory of the case, complete with diamond cutter. West started laughing. "That's a great theory," he said. "But you don't have a witness. You don't have the stamp, and you don't have the diamond cutter. So what can you prove?"

"Nothing yet," said the sheriff. "But I'm calling the city police to send over someone with a search warrant. And while I'm gone, you're going to have three bodyguards."

## The Gang Stands Guard

Ricardo moved over to block the closed door. West did not lose his cool. "I'd like to see you pin this one on me," he said.

Ricardo wondered how they would ever find anything as small as a stamp in this mess. And what if West had already delivered it to someone? Then something about the potted plant caught his eye. He glanced at it again quickly so West couldn't notice. Then he knew why the plant had puzzled him.

At that moment, Sheriff Forbes returned. "The police will be here shortly."

Ricardo said, "When they come, tell them to look under that plant."

West jumped up. "You—" he began. Then realizing he had given himself away, he tried to run for the door. But the sheriff and Ricardo were there.

"How did you find the stamp?" asked Zack.

"Well, look at that plant," Ricardo said. "It's

growing toward the wall. But green plants always grow toward the sun. Its leaves should be pointing toward the window. This pot's been moved recently. And I bet you can guess why."

With Sheriff Forbes still holding West, Vikki and Ricardo lifted the plant pot. Under it, safely wrapped in plastic, was the stamp.

After the police came for West, it was all over. Later the police told the Gang that a robbery ring had sent West to steal the stamp for a rich collector. West knew he would need a non-metal glasscutting tool, so he borrowed a diamond cutter from the jewelry shop where he worked. Such tools have wooden handles because diamond cutters often work with high heat. After the robbery, West had put the stamp in a special false heel in his shoe where it wouldn't be found in a search. He had thrown the tool out the window into the trees.

"Deputy Novak called to say they've already found the tool," said the sheriff. "And we have the stamp back as well, thanks to you three."

"Best of all, Mr. Chan is cleared," said Vikki.

"He said to say thanks to all of you for that," said the sheriff. "Mr. Bloodhound was certainly right about you," he laughed. "Next time the museum puts on a Sherlock Holmes exhibit, you should be put in with the great detective. You're the ones who solved the Case of the Invisible Knife."

**Next month begins  
an exciting new  
Bloodhound Gang  
adventure!**





# Satellite Maze

Can you find your way across this crowded sky without crashing into any satellites?

START



FINISH

Answer on page 37.



# ANIMAL TREK



Sometimes different kinds of animals migrate together. In Africa, herds of zebra, gnu and gazelle travel the same migration route. Often they can be seen grazing together.

The rainy season starts in December, in central Africa. At that time, those animals leave their woodland home and head south for the grassy plains. There they can find fresh grass and all the water they need.

By June, the dry season has begun. The animals must leave the plains, where the food and water are becoming scarce. They return to the woodlands. Next December, their journey begins again.

## How to Play

1. Each player uses six coins for playing pieces. This is your herd. Decide if you are a herd of zebra, gnu or gazelle. Place your pieces on **START**.
2. Use one of two dice to move around the board.
3. When you land on a space that says **MEMBER OF THE HERD DIES**, you must return that piece to **START**.
4. When you land on a space that says **GIVE BIRTH**, you may take one of your pieces from **START** and place it on this space.
5. The first player to get all six pieces to **FINISH** is the winner. Each piece must land exactly on the **FINISH** space.

BEGIN  
MIGRATING  
GO AGAIN

START LEAVING  
SCRUBBY  
WOODLAND  
AHEAD 1

THESE  
FLY BIRDS  
LOSE  
A TURN

MEMBER  
OF THE  
HERD DIES

IT'S A  
THUNDER  
STORM  
AHEAD 1

ESCAPE  
FROM  
POACHER  
AHEAD 1







FINISH

HERD MEMBER  
WANDERS OFF  
LOSE  
A TURN

GRAZE  
WITH OTHER  
ANIMALS  
GO AGAIN

MEMBER  
OF THE  
HERD DIES

WATER  
HOLE  
RUNS DRY  
BACK 1

RELAX  
IN THE  
SHADE  
AHEAD 1

GIVE  
BIRTH

LION  
EATS YOU  
LOSE  
A TURN

LION  
BITES  
BACK 2

STORM  
APPEARS  
GO AGAIN

FIND NEW  
WATER HOLE  
AHEAD 1

GIVE  
BIRTH

WATER  
HOLE  
RUNS DRY  
BACK 1

HYENA  
EATS YOU  
BACK 2

MEMBER  
OF THE  
HERD DIES

RAIN  
FALLS  
AHEAD 1

HYENA  
BITES YOU  
BACK 1

GIVE  
BIRTH

ARRIVE  
ON THE  
PLAINS  
GO AGAIN

William of Stars



# Growth

by Ellen Weiss

Don't look now, but your tonsils are shrinking. Your heart is beating slower all the time. And the organs in your body are moving around.

Are you alarmed? Don't be. These changes are happening so slowly that they can hardly be measured. But they are all natural parts of the process called growing.

Growth means a lot of things. To you, it mostly means that you are getting taller, and that you have to keep cutting your toenails. But growth is more than that. It's really the whole story of how you change from a baby to a teenager to an adult to an old person.

This month, *Busy Bodies* takes a look at what is happening to your heart, your eyeballs and, yes, your toenails. You may even grow to be interested!

## Cell Blocks

Of course, part of growing is getting bigger. One way your body does this is by making more and

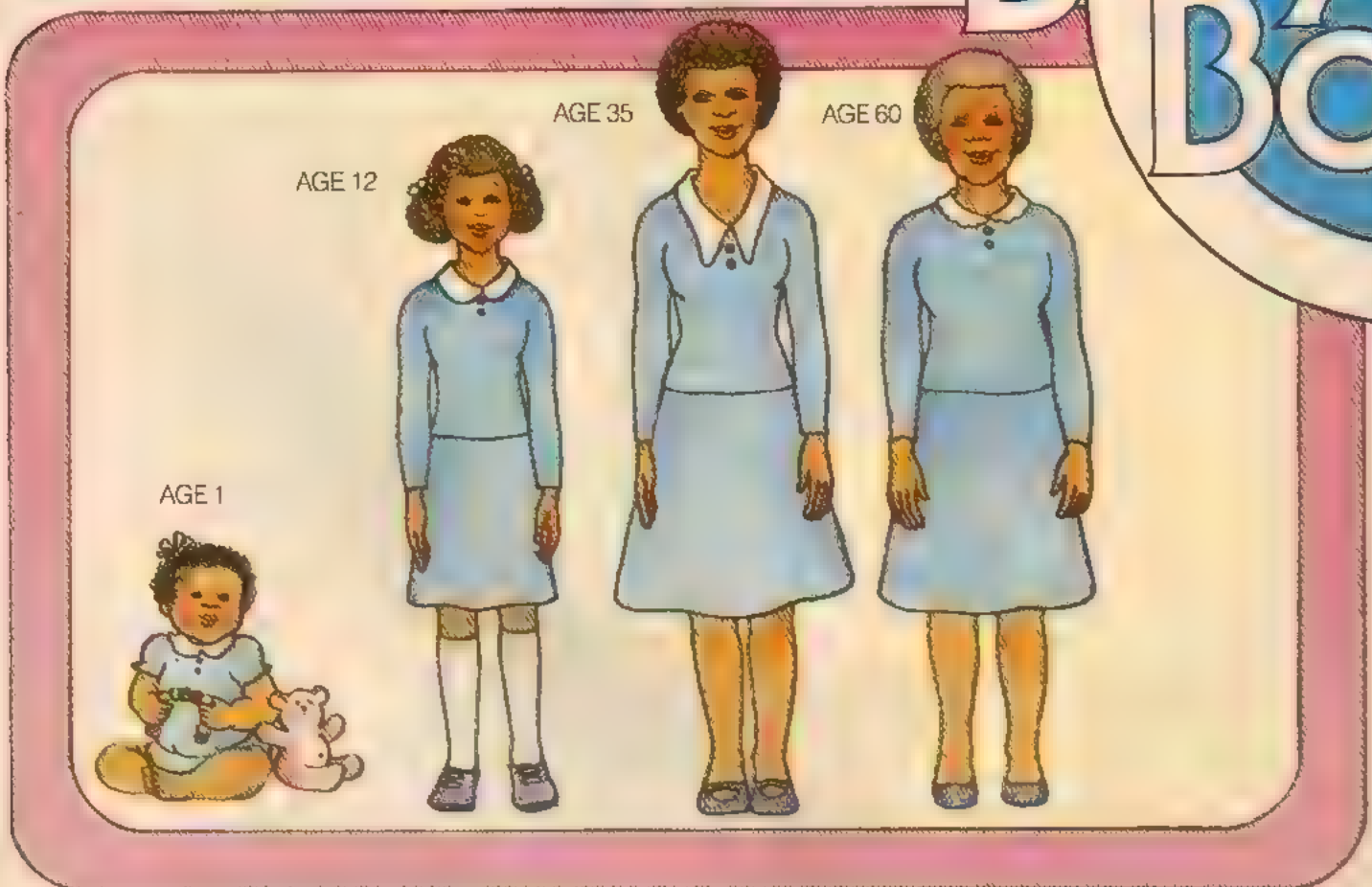
more cells. Like all animals, you start out with only one cell. But by the time you are grown up, you have 60 trillion cells.

Where do all these cells come from? From each other, that's where. Most of your cells are able to divide in two. That means their number can grow very quickly, which is very important. Some of your cells die every day. But by splitting in two, your other cells make more than enough to replace them. That's why, no matter how many times in your life your sunburned skin peels, there's always more skin left.

Your brilliant body doesn't just keep making cells, though. It also separates cells into different kinds. They look different and they act differently. You have liver cells and skin cells and brain cells and blood cells, and lots more.

Some cells in your body don't divide after you are born. They just get bigger. Your brain and muscles work that way. And your heart will grow about 16 times bigger in your life. But it won't have any more cells.

# BUSY BO







## Everything Is Relatives

Will you be long and tall? Short and sweet? It's not just luck that decides. Here are some of the ways your body knows how big to get:

**Heredity** The best way to be big and tall is to have big, tall parents. You see, every cell in your body has tiny information centers in it called genes.

Your genes determine many things, including how tall you can grow. Half your genes are inherited from your father, and half from your mother. So if both of your parents are tall, there's a good chance you will be tall, too.

**Hormones** Hormones are chemicals. They are made by small organs in your body, called glands. Hormones have a lot to do with deciding when you grow, how much you grow and when you stop. A tiny nerve center in your brain tells the glands when to start making hormones and when to stop making them.

Hormones are very important, but they have to listen to your genes. When the most powerful growth hormone is injected into a member of the tiny Pygmy tribe, absolutely nothing happens. His genes are saying, "Don't grow any more. You're as big as you're supposed to be."

**Food and Feelings** The most important factors in how you grow are things inside your body, like genes and hormones. But your environment has something to do with growth, too. Take food, for example. Kids who eat well-rounded, nourishing meals really do grow more. After World War II, children in Germany didn't get enough food. These hungry kids were more than a year behind in their normal growth. Once they started getting the food they needed, they quickly caught up.

Even feelings can affect your growth. In one scientific experiment, it was discovered that unhappy children did not grow as quickly as happy children, no matter what they were eating!

## Digger Isn't Always Better

Growing is nice, but stopping is nice, too. That's what scientist J.B.S. Haldane discovered. He decided to figure out what would happen if people grew to be like some 60-foot giants he found in a picture book. Using laws of physics, he came up with an answer. Giants' bones wouldn't be strong enough to hold up their bodies. They would break their legs with the first step they took.

By the way, King Kong would not do much better. If there really were such a giant ape, he would have to walk very carefully. If he tried to run or jump, he would crush his ankles! ➡➡



## The Amazing Growing Process

All people grow in spurts. The most amazing spurt happened before you were born. In those nine months, your weight multiplied three *billion* times! (Remember, you started out as one cell.) When you were born, you kept growing at a good clip. On your first birthday, you weighed three times as much as when you were born.

By your second year, you began slowing down. You settled into a slow, steady growing pace. But watch out. Something big is coming your way. Your body is about to explode into action, in its last great growth spurt. Just as a short time changes a baby into a child, a child now becomes an adult.

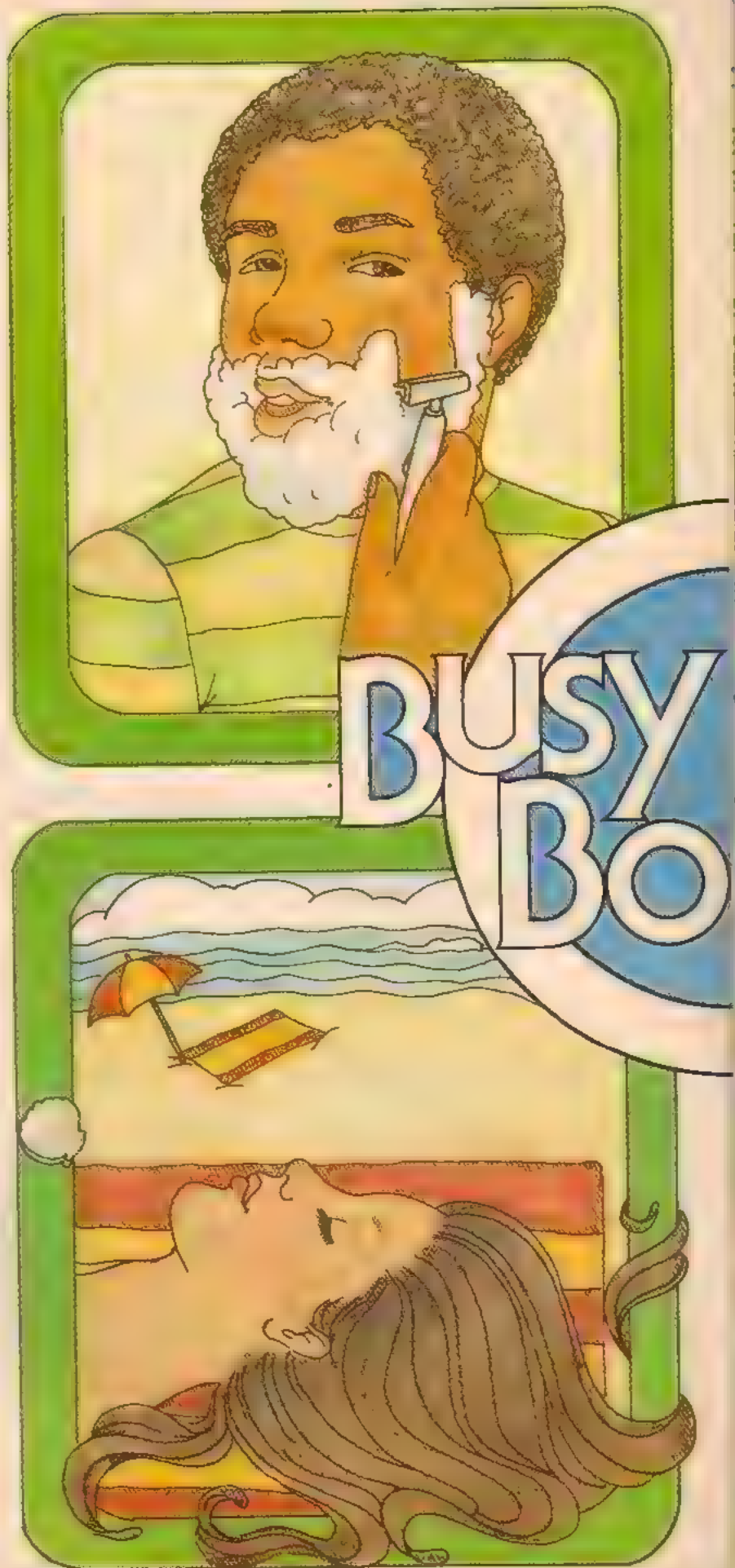
This growth spurt starts for girls around the age of 10 or 11, and for boys slightly later. The greatest growth takes place over two or three years. It continues until you're 17. Then your body "puts on the brakes." By then you have reached 98 percent of your mature height.

Growth in size isn't the only great change. You may not be an adult, but you will look a lot more like one. For example, there will be a lot more hair on your body. If you're a boy, your voice will get deeper. If you're a girl, you will begin the monthly cycle which signals the start of childbearing age.

What happens when it's over? Do you stop growing? Yes and no. Your face keeps changing. Some people say your nose grows very slowly for the rest of your life. Your head grows slowly until you are 60. But for the most part, you are done with growing.

## A Few Fun Facts That Will Amuse You

- The tallest person on record was an American man who was nearly nine feet tall. The shortest adult measured only 16 inches.
- Your height increases faster in the spring than it does in the fall.
- Your hair and nails grow fastest in summer.
- Your thumbnail grows nearly two inches every year.
- The teeth called second molars were also known as "factory teeth." They appear in your mouth when you are 12. This used to mean you were old enough to go to work in a factory!





MEASUREMENTS	TODAY'S DATE	ONE YEAR LATER
HEIGHT		
WAIST SIZE		
DISTANCE AROUND HEAD		
LENGTH OF NOSE		
DISTANCE FROM ELBOW TO SHOULDER		
LENGTH OF BIG TOE		
DISTANCE BETWEEN TWO FRECKLES		
DISTANCE FROM KNEE TO ANKLE		

## My How You've Grown

Here are two ways to see for yourself how you are growing:

**1. Talk to your doctor.** Chances are good that your family doctor has records of your height and weight going back to when you were a baby. He or she might let you have a copy of the figures. You could even make a graph to see how you grow from one year to the next.

**2. Be a guinea pig.** If you are willing to think about it a year from now, you can find out a lot about how you grow. Using a tape measure, fill in this growth chart. If you don't have a tape measure, use a piece of string. Then measure the string. Either way, it might be easier to have someone help when you take your measurements.

The hardest part of this chart is remembering to check your measurements a year from now. You can't wear a piece of string on your pinkie for a year. Measuring yourself on a birthday or holiday might help. When your year is up, measure yourself again. Did all of you grow at the same rate?

## Onward and Upward

Over the years, people have noticed an interesting fact. For as long as anyone has kept records, people have been growing taller and heavier. If you ever go to a historical museum, ask if there is a suit of old armor there. Then ask an adult to stand next to it. Those big, strong knights weren't so big and tall after all!

People are different heights all over the world. But the tallest and shortest groups of people live on the continent of Africa. Members of the Dinka tribe on the average are six feet tall. (Some are a lot taller.) Members of the Pygmy tribe rarely get taller than four and a half feet.



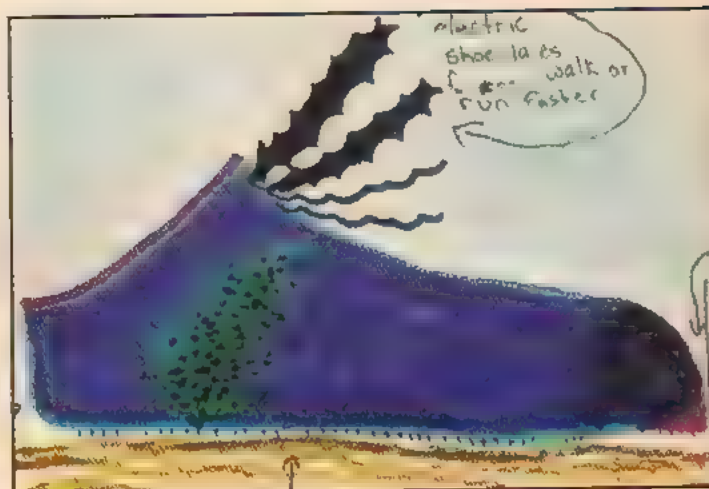


# MAIL

**Contest Winners** Thanks for sending in all those great future sneakers. Here are a few of our favorite ones:



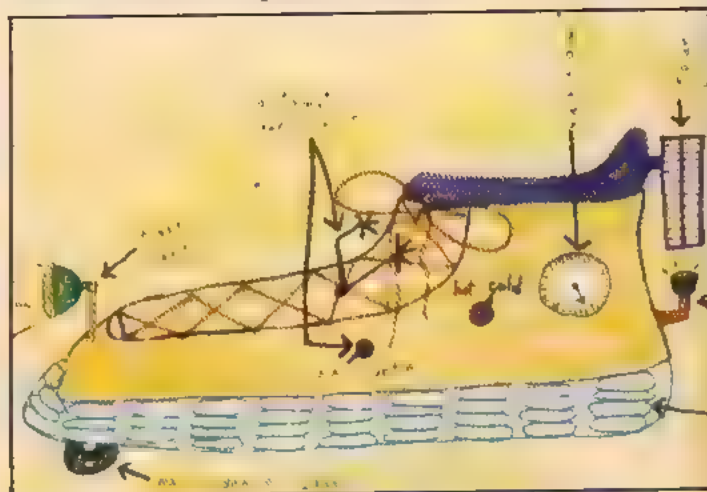
**Jenny Wilkinson, St. Louis Park, MN.**  
With these sneakers, you can even fly.



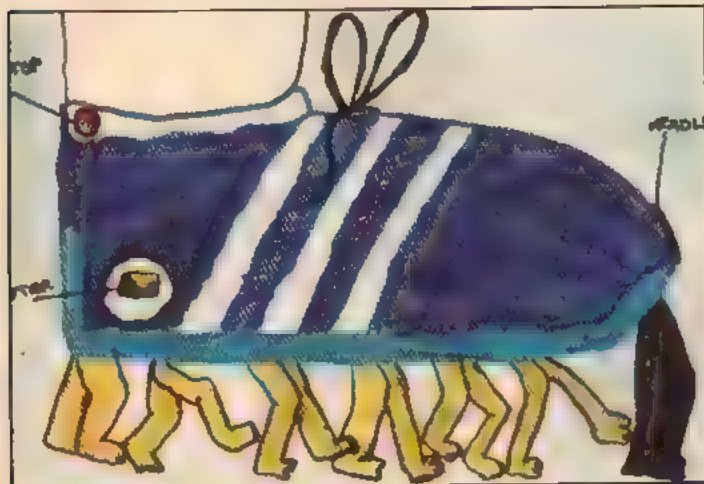
**Marci Guntov, Pacific Palisades, CA.**  
Marci's sneaks have spikes to kill bugs.



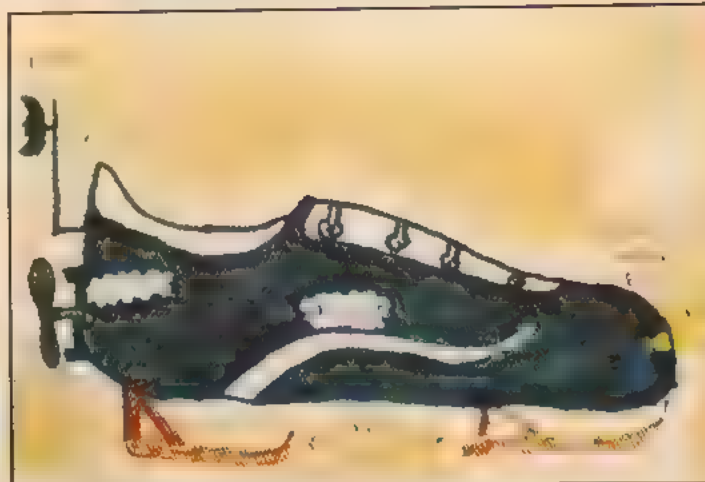
**Ben Wong, Milwaukee, WI.**  
Push a button to change these sneakers for any sport.



**Patrick Innes, Belton, TX.**  
A solar cell heats and cools Patrick's sneakers.

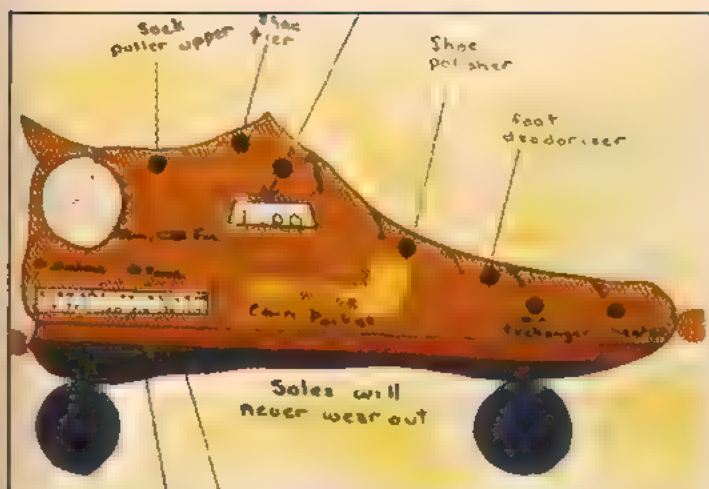


**Trevi Diles, Houston, TX.**  
The bottom of this sneaker has running feet.



**Peter Sargent, Marshfield, MA.**  
The Ski-ker has mini skis on the bottom.

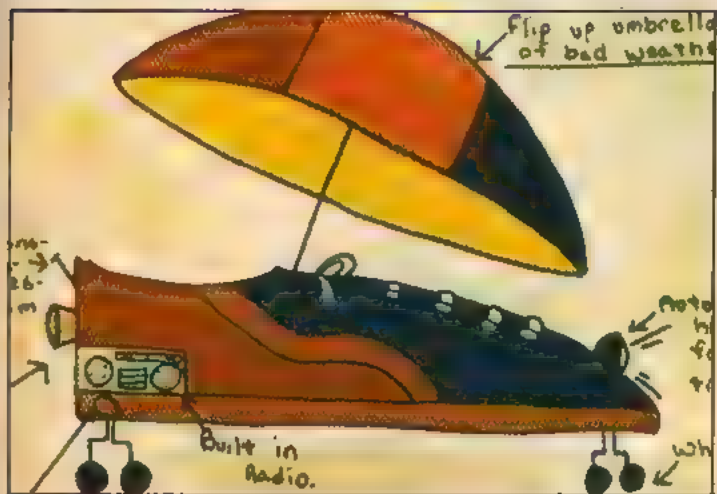




**Elsie Jacobsen, Minden, NE.**  
Elsie's sneaks have a built-in radio.



**Melanie Moravich, Oak Park, IL.**  
These sneakers let you walk on water.



**Lisanne Delgado, Brooklyn, NY.**  
There's even an umbrella for bad weather.

## Mystery Island Winners

The correct answer to the Mystery Island Contest was Bermuda. Congratulations to everyone who figured it out. Here are the names of our contest winners — the first five letters we picked with the right answer.

David Melkert, Erhard, MN  
Erich Ziegler, Terra Bella, CA  
Chuck Henke, Vermillion, SD  
Darryn Johnson, Justice, IL  
Kris Klein, Comstock Park, MI

## Name That Gadget!

Remember that weird gadget we asked you to tell us about. Well, lots of you came up with great descriptions. Here are our favorites:

I call your gadget the North Star finder because it can easily locate the North Star.

**Brian Halligan, Baldwinsville, NY**

The gadget you discovered was a solar peanut-butter-and-jelly sandwich maker that also plays ping pong and works as a bulldozer if it starts to rain and thunder. It also smells like lavender to clear up your sinuses. It is just called X-47 trams.

**Rachel Mooney, Wallkill, NY**

This interesting gadget is a dump-a-scope. It is used to analyze meteorites that have fallen to earth.

The dump-a-scope can be driven to the sites where meteorites can be found. It has a grinder that grinds the meteorites into thin powder, so they can be analyzed. The little clock thingy measures the amount of heat that is in each meteorite. The typewriter types the results out. The telescope is for seeing when a meteorite is near. The calculator measures the distance.

**Lisa Scovel, Citrus Heights, CA**

A Time Digger Machine because it has a clock, bucket, buttons, and an engine. You push the buttons and that's what makes you go back in time. Or you can use the bucket to dig under the ground.

**Danny Bowdoin, Brooksville, FL**

I think your gadget is an automatic ice cream scooper. The carton of ice cream is put between the things at the bottom. The shovel comes down and scoops the ice cream up. The ice cream goes down into the machine and comes out the smokestack. The letters and numbers are for telling the machine how much ice cream you want.

**Amy Watzke, Marblehead, MA**



# Reviews &

## Animals on the Move

You read a bit about migration on page four. If you want to know more, you can find lots of books on migrating animals at the library or in a bookstore. Here are a few to try.

**Biography of an American Reindeer** Each year reindeer herds travel hundreds of miles into the far north during spring. In the fall they head south again. In this book, Alice Hopf follows one young reindeer on this journey. You'll read about the dangers and problems these animals face, trying to survive in the wild. The book is published by G.P. Putnam's Sons.

**The Butterfly** You already know that some butterflies migrate. But you can find out lots more about them in this book by Cynthia Overbeck.

You'll find out what different kinds of butterflies look like and how they live. And you'll learn about a pretty neat way nature has given some of these insects to protect themselves. This book is put out by Lerner Publications.

**From One Ancestor** Not all migrations take just a few months. Some can take thousands of years! In this book, Georg Zapper tells the story of the animal that started out in North America as the eohippus. It ended up in Europe thousands of years later—as the horse! This story of migration and evolution is published by Julian Messner.

Here are some books to read and things to do and see after reading this issue of 3-2-1 CONTACT.

### Free Tree!

Soon it will be spring—the time when plants begin another year of growth. You can find out how the biggest plants of all—trees—do their growing. "How a Tree Grows" is a big color poster that you can get free! It shows the parts of a tree and what they do. There are also diagrams that show what goes on inside a leaf and how to tell a tree's age from the rings in its trunk. To get your free poster, write to:

Forest Service, USDA  
P.O. Box 2417  
Washington, D.C. 20013



### 3-2-1 Contest

You all did really well on our last Mystery Island Contest. In fact, some of you said the contest was too easy. So, we decided to make it tougher! Drag out those maps again and try to find this new Mystery Island. Here are the clues:

• In January it is summer there.



- If you think you know the name of our Mystery Island, write



\* Send your answer, with your name, address and T-shirt size to:

**3-2-1 Contest**  
**Mystery Island II**  
**P.O. Box 599**  
**Ridgefield, NJ 07657**

Remember all those satellites we told you about? With luck, you might be able to spot one.

Satellites reflect the sun's light just as the moon does. If the satellite is big and low enough in orbit, you can see it in the sky.

The best time for satellite watching is just after sunset. Look for something that looks like a fairly bright white star. Watch it for a couple of minutes. If it

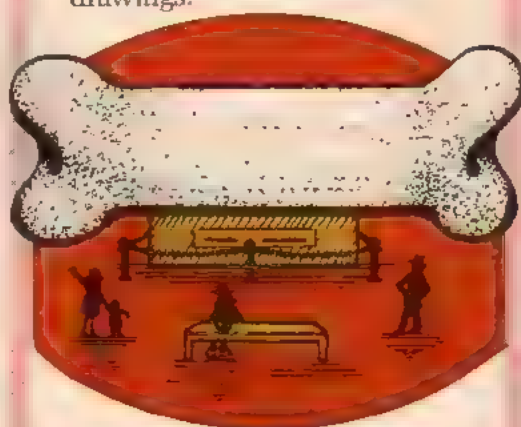


seems to be moving across the sky, it might not be a star at all. You probably have spotted a satellite!

This review was sent in by  
Lisa Bardfeld, Vineland, NJ.

I went to the American Museum of Natural History in New York City. I saw dinosaur bones that were very interesting. There was also a section with models of the solar system and information about each planet.

My favorite section was the art section. It had statues, beautiful clay pots, paintings and drawings.



Next time you go to a museum, why not write a review for CONTACT? If we use it, you'll get a CONTACT T-shirt. Send your review of 100 words or less, along with your name, address and T-shirt size to:

**Museum Review**  
P.O. Box 599  
Ridgefield, NJ 07657

In this month's Earth Works you read all about swamps. Want to take a look for yourself? Here are places where you and your family can explore one. Alakai Swamp, Hawaii  
Acadia National Park, Maine

Aransas National Wildlife  
Refuge, Texas  
Bear River National Wild-  
life Refuge, Utah  
Blackwater National Wild-  
life Refuge, Minnesota  
Cape Cod National Sea-  
shore, Massachusetts  
Four Holes Swamp, South  
Carolina  
Glacier National Park,  
Montana  
Grand Teton National Park,  
Wyoming  
Great Cypress Swamp,  
Delaware  
Isle Royale National Park,  
Michigan  
Malheur National Wildlife  
Refuge, Oregon  
Okefenokee National Wild-  
life Refuge, Georgia  
Reelfoot National Wildlife  
Refuge, Tennessee





# Experiment

## Plant in a Maze

This month, the Bloodhound Gang discovered a plant growing away from the light. They used this clue to solve a crime. To find out more about growing plants and light, try this experiment.

### What You Need

a small green plant in a pot	a piece of cardboard
a shoebox with lid	tape and scissors

### What You Do

1. Cut a hole in one side of your shoebox.
2. Cut out two strips of cardboard. Tape them to the inside of the box, as you see in the picture.
3. Place your plant in the end of the box away from the hole. Make sure the plant will fit when the cover is on. (For best results, choose a small plant that grows quickly.)
4. Put the lid on the shoebox.

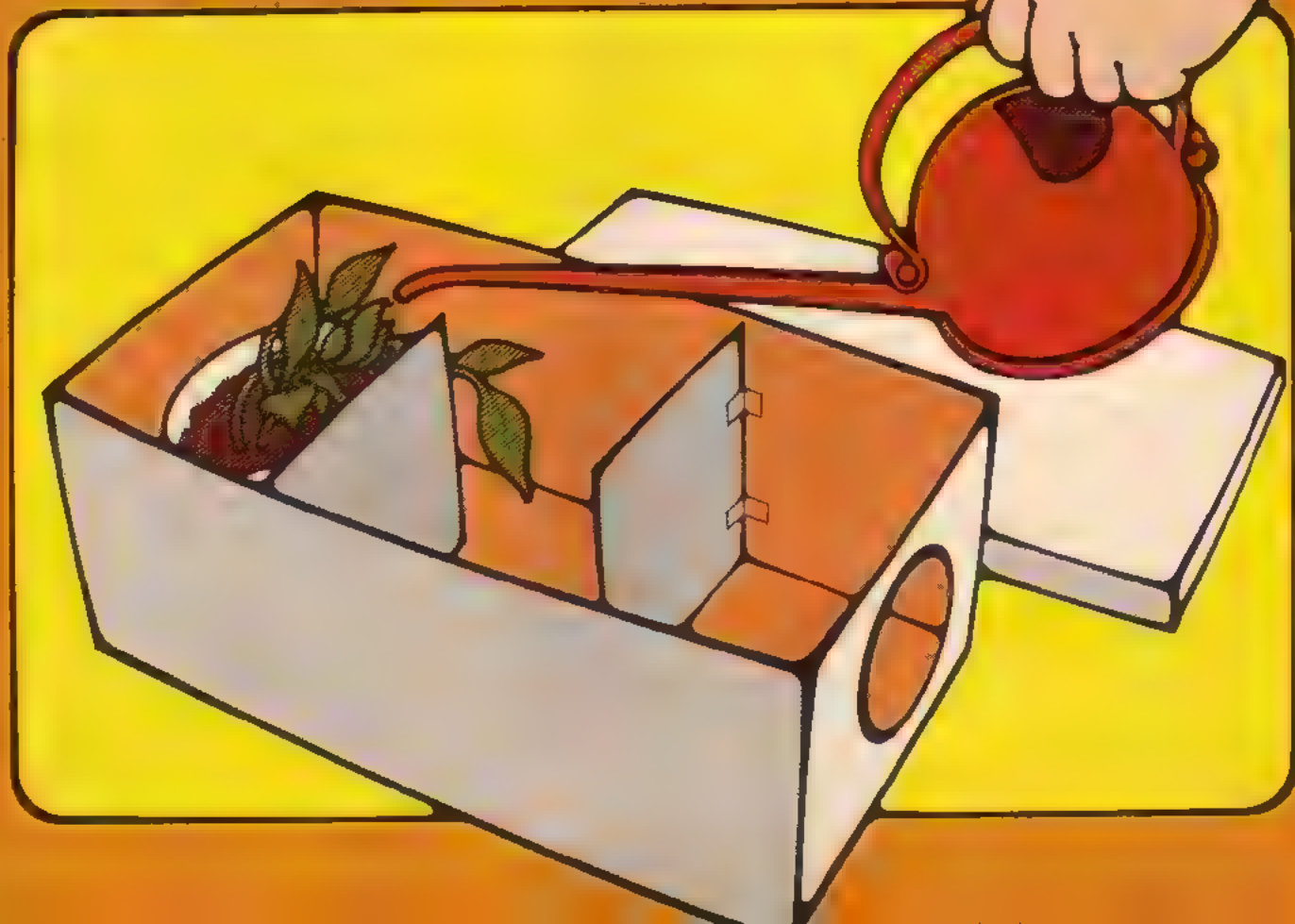
5. Place the box near a window, with the hole side pointing toward the window.

6. Every few days, remove the lid and water the plant. Watch as the plant slowly grows around the pieces of cardboard. If you wait long enough, the plant will grow right out the hole!

### Why It Works

Chemicals in your body determine how fast you grow. The same thing is true in green plants. At the tip of a plant's stem is a chemical called *auxin*. A plant always grows quickest at the places where the most *auxin* is found.

When light shines on a plant's stem, the *auxin* slowly moves to the side with the least light. That side will grow faster. As a result, the plant bends toward the light. That's what happened in your shoebox. Your plant wound its way around the barriers. The *auxin* in the stem caused it to grow to the light. Since no green plant can live without sunlight, you can see why *auxin* is so important.

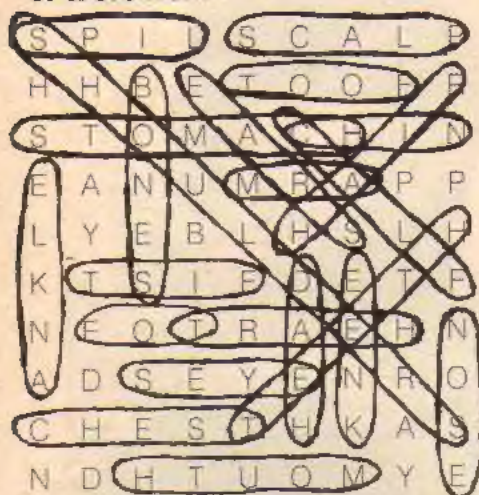




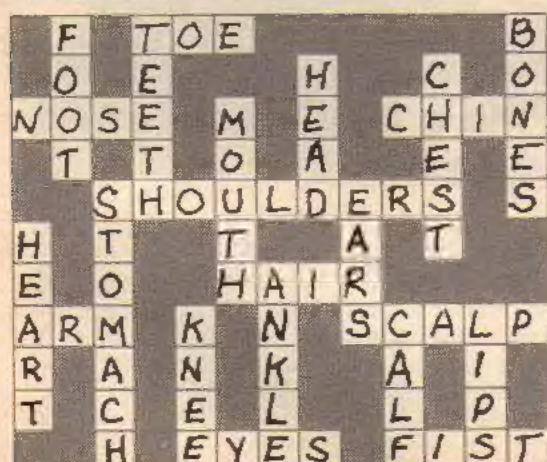
# Did It!

## Body Puzzles (page 9)

### 1. Word Hunt



### 2. Crossword



## OOPS!

In the October, 1981, pig puzzle, the letter B was missing. So it was impossible to make the word BACON. Thanks to all of you who caught our mistake.

### Credits

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## Maze (page 25)



## Next Month!

### The Scoop on Loot

What happens to money before it ends up jingling in your pocket.

### Bloodhound Gang

A brand-new adventure for Vikki, Ricardo and Zack.

### Spring Has Sprung

Find fun things to do in this special spring section.

**Plus Factoids, Mail, Timeline and Much More!**



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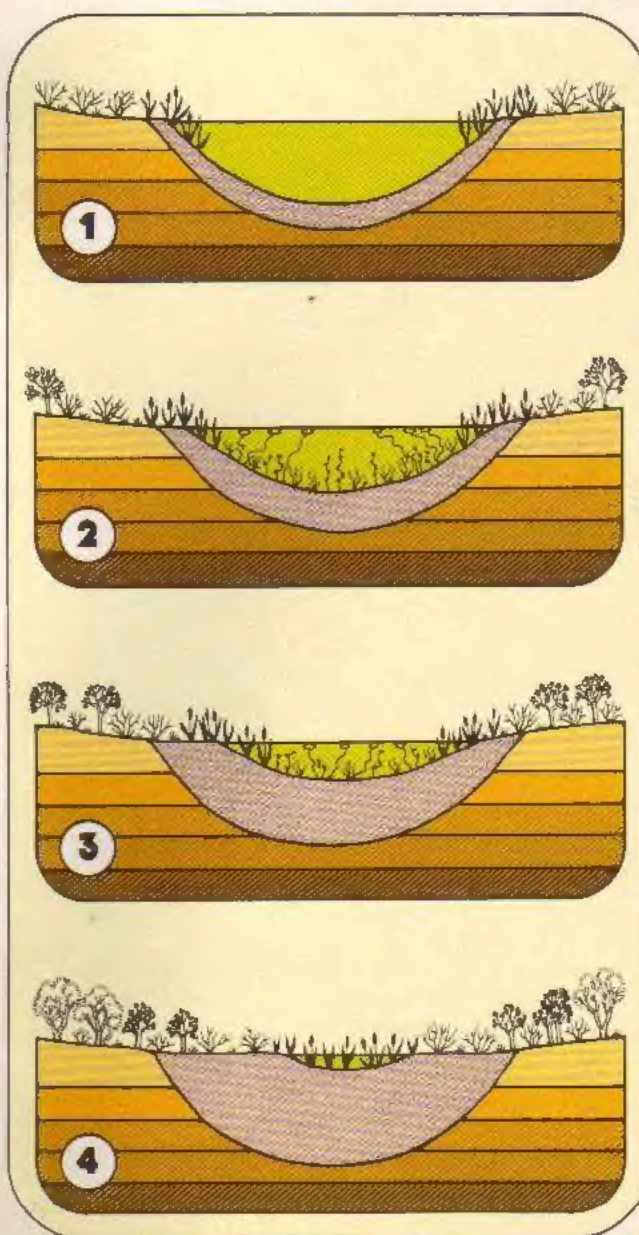
## Earthfacts: Swamps

Each month CONTACT will bring you another Earth Works. Save these pages in a notebook. Soon you will have your own guide to the wonders of the planet earth.

- Swamps are wet lands covered with grasses, bushes and trees. They form near lakes, rivers or the sea, on lowlands where water doesn't easily drain away.
- Many swamps have layers of peat under them. Peat is formed from dead, decayed plants that pile up in layers on the swamp floor. Peat burns well when dried. In some places, it is dug out of swamps and used for fuel.
- The Seminole Indians were the first settlers of the Okefenokee Swamp. The name Okefenokee comes from a Seminole word meaning "land of the shaking earth." It's called that because islands of peat that float on the swamp's waters wobble and shake when walked on.
- Swamps have many strange plants—including some that eat insects. Plants need nitrogen to live. But they can't get enough from swamp soil. So they trap insects and get nitrogen from the bugs' bodies.
- Hawaii's Alakai Swamp is very unusual. It's the only swamp located in the crater of a volcano.
- Because most people stayed away from swamps, they used to be good hideouts for outlaws. One gang of robbers lived in Louisiana's Honey Island Swamp. When the gang members died, they never told anyone where they hid their loot. Some people say treasure is still buried somewhere in the swamp.
- Besides serving as a home for wildlife, swamps also help by regulating the flow of water during heavy rains. This can prevent floods in areas nearby. During droughts, swamps can release stored water for dry areas around them.
- Some people have told tales of seeing glowing figures at night in swamps. Because the swamps were dark and mysterious, some people thought they were seeing ghosts. The truth is that some kinds of bacteria and mushrooms found in swamps do glow in the dark. Also, the decay of plants underground gives off gases that might seem to glow. But ghosts? No way!

## EarthWorks

**Below:** If left alone, swampy areas can turn into dry land. **1.** This swamp pond is being filled in by dirt. **2.** Plants begin to grow at the bottom. **3.** The pond gets smaller as more and more dirt fills in and bigger plants begin to grow. **4.** Eventually, the whole pond is filled in. The dry land can support bushes and trees.





Okefenokee is the United States' largest protected swamp.

### Focus on Swamps

In the southeast corner of Georgia there is a watery wilderness—the Okefenokee Swamp. It is a land where alligators slither through dark, twisting waterways, and where dense forests of trees grow, draped in moss.

The unusual plant and animal life in the swamp scared many of the area's early settlers. They imagined all sorts of strange things went on there. One tale told of a large black snake that lured people into the swamp by singing beauti-

ful songs. Once inside, a person would disappear, never to be seen again!

Because most people avoided Okefenokee, it became a refuge for those who had nowhere else to go. At various times, it was home to Seminole Indians, runaway slaves—even outlaws!

Okefenokee is not as dangerous as the early settlers thought. But even today it is a place that should be explored with care.

(continued on page 39)